Art. XVI.—*An Attempt to Estimate the Population of Melbourne at the present time.*

By James Jamieson, M.D.

In a new country like Victoria changes in the population are rapid, not merely in the total number, but also in respect of its constitution as regards age and sex. It is unfortunate that the census is taken only at such long intervals as ten years, since changes, which can hardly be estimated correctly, may have taken place long before that period has elapsed. The Government Statist, making the best use of data at his disposal, publishes monthly statements of the vital statistics of Melbourne and suburbs, and quarterly estimates of the population of the whole colony. But, as he admits, his estimates are only probabilities; because, though the number of births and deaths is matter of actual record, and must be almost exact, the arrivals and departures, by sea and across the border, cannot be known with like exactness. At one time, therefore, the increase of population may easily be greater, and at another less than is supposed. And if the totals for the whole colony are thus rather uncertain, still more must there be liability to doubt about changes in the distribution of the population in particular localities, unless some careful local census is taken at short intervals. It is obvious to anyone who travels about the city and its suburbs that there has been a large reduction in the population of Melbourne during the last two years at least. Mr. Hayter's calculation is that while, at the census in April, 1891, the number was 490,896, it had fallen, on 31st December, 1893, to 444,832, a decrease of no fewer than 46,064 persons in two and three-quarter years. In arriving at his estimate for the later date, Mr. Hayter has to depend on figures supplied by the municipal authorities in the various districts. These figures again are not arrived at on any uniform system. In some there is an actual rough census, taken by the officials when making valuations or collecting rates ; and in others the calculation is based on the number of premises, known or assumed to be unoccupied, allowance being made for the average number of persons to each house, as ascertained at the

last census. These returns from the municipalities date back to about September last, the figures being adjusted in the Government Statist's office, and brought up to the end of the year.

That the figures thus obtained are liable to considerable uncertainty must, I think, be admitted. It may be interesting, therefore, at a time when the country is taking stock of its resources, to test the correctness of these estimates by an altogether independent method.

The birth rate in any community is a tolerably fixed quantity. Taking the three years, 1890-92, as an example, it appears that in Victoria the birth rate averaged 33·24 per 1000, with extremes of 33·60, and 32·54. The rate does vary, of course, but only to a slight extent within any short period. The probability, therefore, is, that if the rate seems to vary greatly, within a very short period, there is some error in the figures used, the most likely source of error being in the population figure, the number of births, being matter of almost exact record. It is this test of the birth rate, or, rather, the variation in the births recorded, which I propose to apply for arriving at an estimate of the population of Melbourne in the present year. For this purpose I will take the first half of several successive years for comparison.

TABLE I.

Showing the Number of Births Registered in Melbourne and Suburbs for 1890-94.

	1890.	1891.	1892.	1893.	1894.
January -	1251	1316	1429	1288	1123
February -	1480	1259	1443	1227	1057
March -	1540	1338	1649	1353	1259
April -	1478	1648	1297	1273	1123
May -	1612	1641	1657	1369	1251
June -	1675	1628	1470	1411	1142
	8957	8830	8945	7921	6955

The census population, at 5th April, 1891, can be taken as providing a correct birth rate for the first half of that year, viz., 17·987 per 1000. Taking that rate as a standard, and applying it to 1894, we can proceed to calculate back to the population which would provide the number of births recorded, viz., 6955. The figure of population thus brought out is 386,668. It is of course a mere assumption that the birth rate of 1894 was the same as that of 1891, and it cannot be claimed for these figures, therefore, that they are free from error. The question remains then whether their correctness can be submitted to test.

The death rate is, on the whole, a more variable quantity, from year to year, than that of births, and if it cannot therefore be so safely used for purposes of comparison, it may still be applied as a check in a similar way.

TABLE II.

Showing the number of Deaths Registered in Melbourne and Suburbs for 1890-94.

	1890.	1891.	1892.	1893.	1894.
January -	998	874	776	702	718
February -	878	733	698	665	599
March - -	995	792	862	696	623
April - -	973	749	645	632	530
May - -	797	654	607	518	537
June - -	651	649	614	631	493
	5294	4451	4202	3844	3500

Taking again the year 1891, as that for which we have exact figures, it appears that the death rate for the first half of that year was 9·06 per 1000. And using that rate as our basis it results, that the population needed to produce the number of deaths in the first half of 1894, viz., 3500, was 386,313. As this figure is almost identical with that arrived at on the basis of the

birth rate, it is fair to assume that the actual population in the first half of the present year, approached nearly to that which has now been calculated out.

It might be supposed that it would have been a safer procedure to take the three years, 1890-92, as the basis of calculation as supplying greater probability of a fair average. I do not think, however, that this is actually the case. It would be necessary to assume that the population of 1891 was the proper average of the three years, and almost certainly this was not the case. For though the population doubtless increased from 1890 to 1891, there can be as little doubt that, instead of increasing further, it had already began to fall off in 1892. This would introduce an element of error into any calculation of either birth or death rate for the three years. And, in the case of the death rate, there would be another source of error, in the fact that 1890 was a year with an exceptionally high mortality, as a glance at the figures in Table II. sufficiently shows.

But though the concurrence of results, on the two modes of reckoning, is remarkable, it must be recognised that with each of them there is liability to fallacy. In times of severe depression it is quite to be expected that there should be some lowering of the birth rate, not of course very quickly produced, and mainly by the previous production of a lowered marriage rate. There has, in fact, been a large reduction in the number of marriages in Melbourne recently, from 5172, in 1890, to 4872, in 1891 ; 4135 in 1892 ; and 3635 in 1893. This reduction in the marriages doubtless came to affect, in some degree, the number of births, though a reduction of about 500 marriages annually does not go very far to account for an annual diminution of births of about 2000 in 1893 as compared with 1892 ; and of as many more, to all appearance, in 1894.

As was already said, there is even greater liability to fallacy in using the death rate as a basis of calculation. And it has to be admitted that the public health was, on the whole, better in the first half of the present year than in the earlier years of the decade. It has been remarked in England that times of trade depression are commonly enough associated with a low rate of mortality. In fact, depression in England or in Australia is hardly such as to be a cause of disease or death to appreciable

extent, as it shows itself to be in countries such as India, where depression becomes actual famine. It is doubtful, indeed, whether depression, such as we suffer from, has any very direct influence on the public health. It is chiefly the degree of preva- lence of epidemic diseases which causes variations of the death rate, and some of these were more largely prevalent in 1890-92 than in the present year. A mere reduction of the number of births, too, has a distinct effect in lessening the death rate, the mortality among young infants being eight or nine times greater than it is among the population as a whole. I do not wish to load this paper with figures not strictly relevant to the main issue, and will therefore content myself with these hints, and admit that the death rate probably was lower in the first half of 1894, than in 1891. That calculations, based on the number of deaths in that year are thus to some extent vitiated, may also be admitted. But that the population of Melbourne has been largely reduced in the present year, in addition to any previous losses cannot be doubted. To get as small a number of births and deaths as are now recorded we have to go back to 1886, when the population, according to Mr. Hayter's estimate, amounted only to 371,630. It does not, therefore, seem to be an extravagant statement, that the population of Melbourne and suburbs, at the present time, cannot greatly exceed the 386,000, which has, by calculation, been arrived at.

But many persons will be found to say that a lessening of population in the metropolis is not a thing to be greatly lamented, if there has been a mere transfer to other parts of the colony. A comparison of the births and deaths in the first half of succes- sive years, in Melbourne and suburbs on the one hand, and in all the rest of the colony on the other, will help to show whether or not this has been the case.

TABLE III.

Showing Births and Deaths in first half of years 1890-94 in Melbourne and rest of Colony separately, and in Victoria as a whole.

BIRTHS.

	1890.	1891.	1892.	1893.	1894.
Melbourne -	8,957	8,830	8,945	7,921	6,955
Rest of Colony	9,609	9,771	9,856	10,386	9,987
All Victoria -	18,566	18,601	18,801	18,307	16,942

DEATHS.

	1890.	1891.	1892.	1893.	1894.
Melbourne -	5,294	4,451	4,202	3,844	3,500
Rest of Colony	4,936	4,191	4,533	4,316	4,493
All Victoria -	10,230	8,642	8,735	8,160	7,993

Certainly these figures show that there has been a marked difference of conditions prevailing in the metropolitan and extra-metropolitan portions of the colony. We are entitled to infer that there has been, at least, no loss of population in the latter portion, since 1891. And if there actually has been a lower than average birth and death rate in the one portion, the same has doubtless been true of the other. In that case, what looks like fixity of population may really indicate some increase. According to Mr. Hayter's estimate, the population of extra-metropolitan Victoria, on 31st December, 1893, was 729,174; while it was only 649,509 at the census in April, 1891. It would be a satisfaction to be able to believe that there was an increase of almost 80,000 persons in the two and three-quarter years; but, in

the face of the figures given in Table III., it is hardly possible to accept the estimate as a correct one. The explanation, doubtless, is that the unrecorded departures have been considerably more numerous than the official figures show. Considering the trials which Victoria has lately undergone, it is fair matter of congratulation, if her population, at the present time, is not less than it was in 1891.